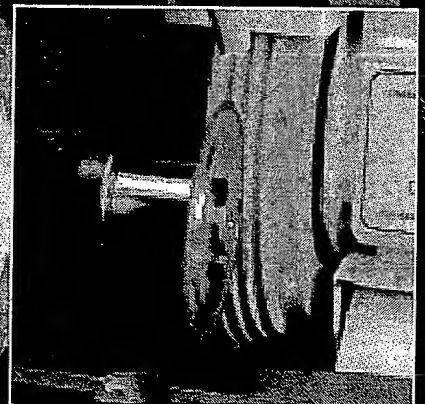
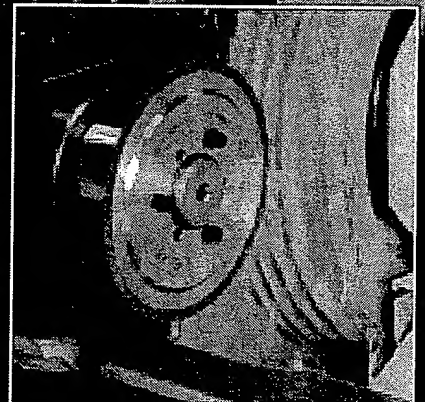
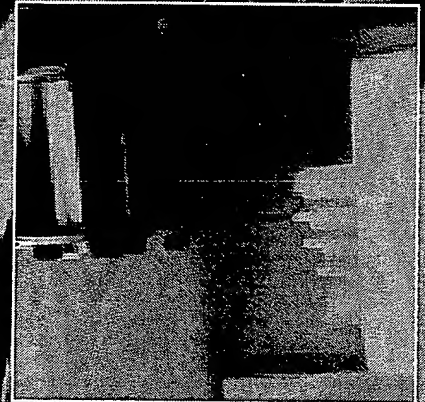
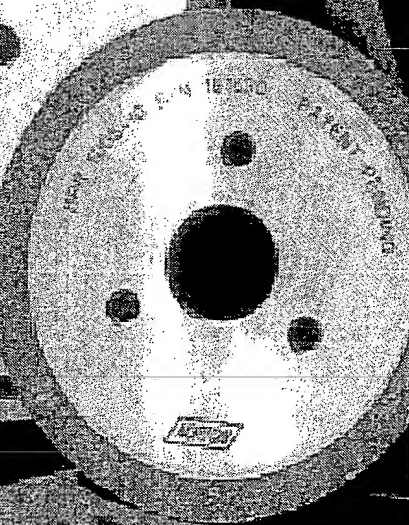
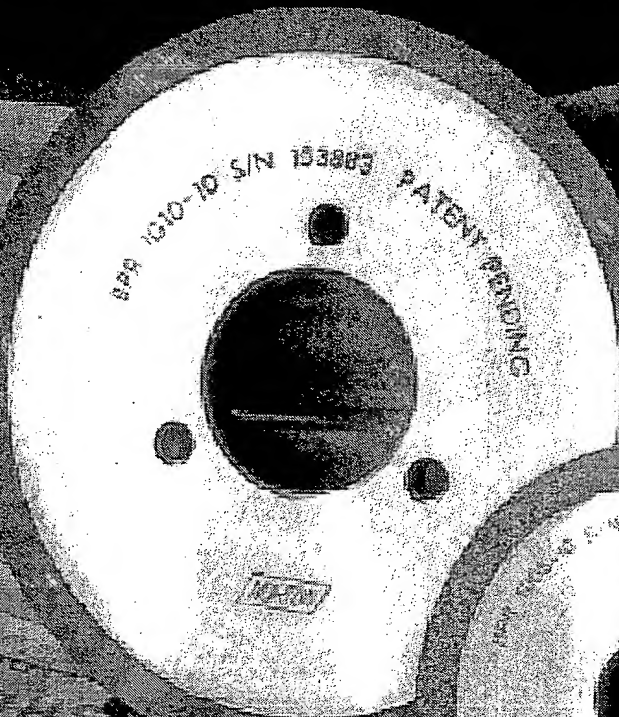


NORTON

LAP-FREE™ BPR PROFILE DRESSING ROLLS FOR CNC GRINDERS

NEW!

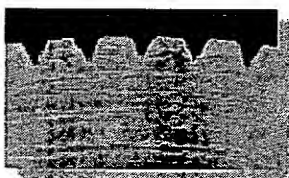


Introducing an advanced generation of longer lasting precision rotary diamond dressers

New Patent Pending Rotary Diamond Dresser Maintains Geometry and Lasts up to 3 Times Longer

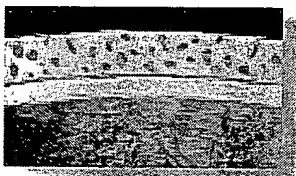
The Lap-free BPR Profile Dressing Roll is produced using an entirely new state-of-the-art (patent pending) manufacturing process that out lasts conventional sintering and infiltrating processes used to make CDP (Cemented Diamond Particles) and RPC (Reverse Plated Construction) rolls.

The new profiling rolls are designed for use on grinders with CNC dressing capacity. The diamonds in a Norton Lap-free BPR roll are carefully secured into position to provide superior diamond retention while maintaining very small radii. Most conventional profile rolls fail from loss of radial form and diamond pullout. Field testing on CNC machines has shown Lap-free BPR rolls lasted significantly longer than similar Infiltrated (CDP) type profile rolls.



DR KAISER ROLL

Photo shows a typical profile roll using Polycrystalline Diamond (PCD) particles which appear square in shape and equally spaced along the periphery of the roll. Field testing in production dressing applications has proven the Lap-free BPR roll lasts significantly longer than rolls of this type.



CDP ROLL USING NATURAL DIAMOND

Photo shows a typical CDP infiltrated profile roll with natural diamond particles which vary in size and shape. The diamond particles used in the Lap-free BPR profile rolls are carefully selected for improved uniformity at higher than normal densities (or concentration), extending roll life.



BPR ROLL

The diamonds in a Lap-free BPR profile roll are very dense, offering significantly more diamond particles for better form holding capability, improved wear resistance, and longer roll life.

TECHNOLOGY BREAKTHROUGH PRODUCES A PROFILE ROLL CAPABLE OF GENERATING FORMS, NEVER BEFORE POSSIBLE.

The new Lap-free BPR rolls are capable of dressing very intricate forms into conventional or superabrasive wheels, while maintaining the desired tip geometry throughout the life of the roll. The innovative patent pending manufacturing process used to produce Lap-free BPR rolls, produces rolls that can retain tip radii as low as .005" (.12mm) at included angles as low as 12 degrees.

REDUCE YOUR FORMED DIAMOND ROLL INVENTORY

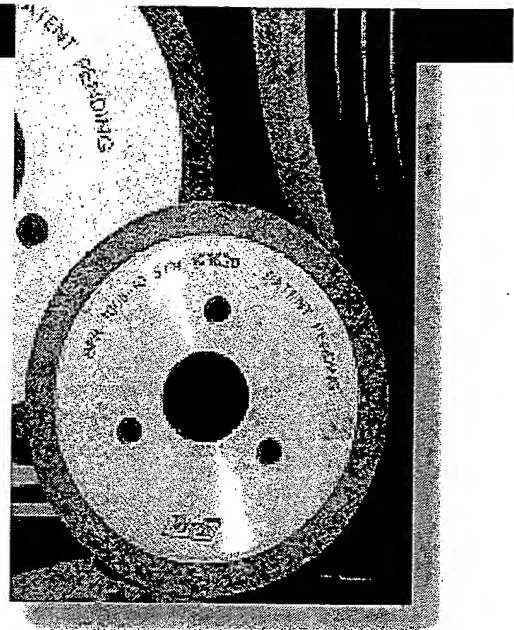
The new profile rolls are available in three basic configurations designed to maximize your machine CNC capability, and/or eliminating the need to inventory expensive formed diamond rolls.

ELIMINATE COSTLY RELAPPING

Norton Lap-free BPR rolls are designed not to require regrinding of the diamond area to restore the tip geometry, and the cost savings are significant. Conventional rolls are often relapped up to 4 times during their productive life at typically 30%- 50% the cost of a new roll for each relapping.

ACHIEVE SUPERIOR PRODUCTIVITY WITHOUT A PREMIUM PRICE

Lap-free BPR rolls improve productivity by eliminating the machine downtime associated with relapping removal and reinstallation. Operators can now easily estimate the remaining life of the roll by simply measuring the roll diameter without removing it from the machine. Simply stated, when using the Lap-free roll you get more for less. Pricing on Lap-free BPR rolls is very competitive with standard infiltrated and reverse plated rolls.



Where to use the Lap-free BPR roll:

The Lap-free BPR rolls are recommended for the following CNC profile dressing applications:

- Profile dressing applications requiring a tip radius of .005" to .025" (in increments of .005").
- Applications requiring very narrow included tip angles from 12 degrees.
- When dressing Conventional and Superabrasive wheels
- Surface finish requirements are greater than 20Ra (0.5um).
- CNC profile dressing on: Normac, Drake, Unison, Studer, Blohm, and Weldon grinders.
- In applications where competitors such as Dr Kaiser, Clipper and Wendt-Dunington use Polycrystalline Diamond (PCD) material.

NORTON

Field Test Data:

Lap-free BPR rolls have successfully dressed the following wheel types: Aluminum Oxide, Seeded gel (SG), vitrified CBN, Resin Bond CBN & Diamond.

FIELD CASE STUDY #1

AIRCRAFT FIR TREE FORM

BPR lasts longer, when dressing aluminum oxide wheels

Machine: Surface grinder equipped with a CNC dresser

Wheel: 12" diameter x 1 1/2" wide 60 grit, aluminum oxide wheel

Roll Rotation: Counterdirectional

Dress Operation: 2 passes

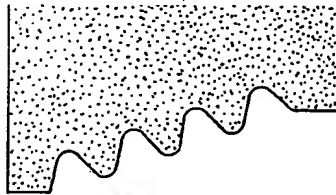
Required Surface Finish: 64ra max

Coolant: Water Soluble

Competitive Roll Life: 13 weeks (which includes relapping at an additional charge)

Lap-free BPR Roll Life: 36 weeks without relapping

Test Results have shown this end use-customer, The NEW Lap-free BPR roll can dramatically improve productivity through reduced downtime associated with frequent roll changeover, and save thousands of dollars by eliminating the need for relapping rolls.



FIELD CASE STUDY #2

FIELD CASE STUDY # 2 ROUTER BITS

BPR dresses resin bond diamond wheel dry and saves over 66%

Machine: Diaform grinder equipped with a manual template dresser

Wheel: 10" diameter x 7/8" wide 120 grit, resin bond-diamond wheel

Roll Rotation: Counterdirectional

Dress Operation: Dress and hold a .005" corner radius in the wheel

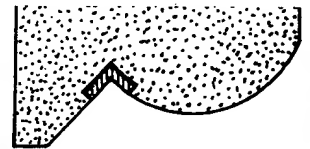
Surface Finish: Not measured

Coolant: Low pressure, non-refrigerated air

Competitive Product: Dressed (2) wheel forms before losing the .005" tip radius

Lap-free BPR Roll: Dressed 62 wheels while maintaining the tip radius until expiring

Test Results have shown this end use-customer that Lap-free BPR rolls can far exceed the form holding capabilities of conventionally rolls, while standing up to the most challenging dressing environments (dressing dry). The BPR roll has reduced the dressing costs in this application over 66%.



FIELD CASE STUDY #3

CASE STUDY # 3 MATCHED GEAR FORMS

The Lap-free BPR reduces dressing costs over 50% and eliminates downtime associated with relapping

Machine: Surface grinder equipped with a CNC dresser

Wheel: 14" diameter x 2" wide 70 Grit, aluminum oxide

Roll Rotation: Counterdirectional

Dress Operation: Restore lost form geometry

Surface Finish: 32 Rms maximum

Coolant: Water soluble

Competitive Roll: Equipped with polycrystalline diamond particles, dressed nearly 70 parts before expiring

Lap-free BPR Roll: Dressed over 150 parts while maintaining the tip radius

Test Results have shown this end use-customer their dressing costs can be reduced by over 50% when using a Lap-free BPR roll, and additional productivity gains are possible by eliminating costly down time associated with frequent roll changes.



FIELD CASE STUDY #4

CASE STUDY # 4 GEAR TOOTH

Lap-free BPR successfully dresses vitrified CBN wheels

Machine: Cylindrical grinder with table mounted CNC dressing spindle

Wheel: 6" diameter X 1/4" wide 240 Grit, Vitrified CBN wheel

Roll Rotation: Counterdirectional

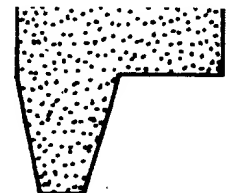
Dress Operation: Generate and maintain a .010" (2.54mm) tip form radius

Surface Finish: 32Rms Maximum

Coolant: Water soluble oil

Lap-free BPR Roll: Dressed 62 wheels while maintaining the tip radius until expiring

Test Results have shown this end use-customer that Lap-free BPR rolls are capable of dressing vitrified Conventional and Superabrasives.



LAP-FREE BPR PROFILE DRESSING ROLLS FOR CNC GRINDERS

Product Description:

Lap-free BPR profile roll basic product configurations are:

Diamond Type: typically synthetic diamond due to the need for uniformity in particle size although natural diamond is used occasionally.

Tip Radius: Currently the Lap-free BPR is offered in the following tip radii sizes: .005", .010", .015", .020", & .025".

OD Sizes: Preferred sizes are 4" and 6" diameter, other sizes are available upon request.

Product Configurations: Although each roll can vary in diameter, bore, mounting holes, etc., there are three basic tip shapes shown below, and a diagram of a typical Lap-free BPR roll.

Product Markings:

Typical roll markings include:

BPR number: the last two numbers indicating the radius.

Serial number

Actual OD measured prior to shipment.

Location dimension measured from the pre-established datum side of the roll to the radius centerline.

Actual tip radius prior to shipment.

Typical BPR Roll Markings:

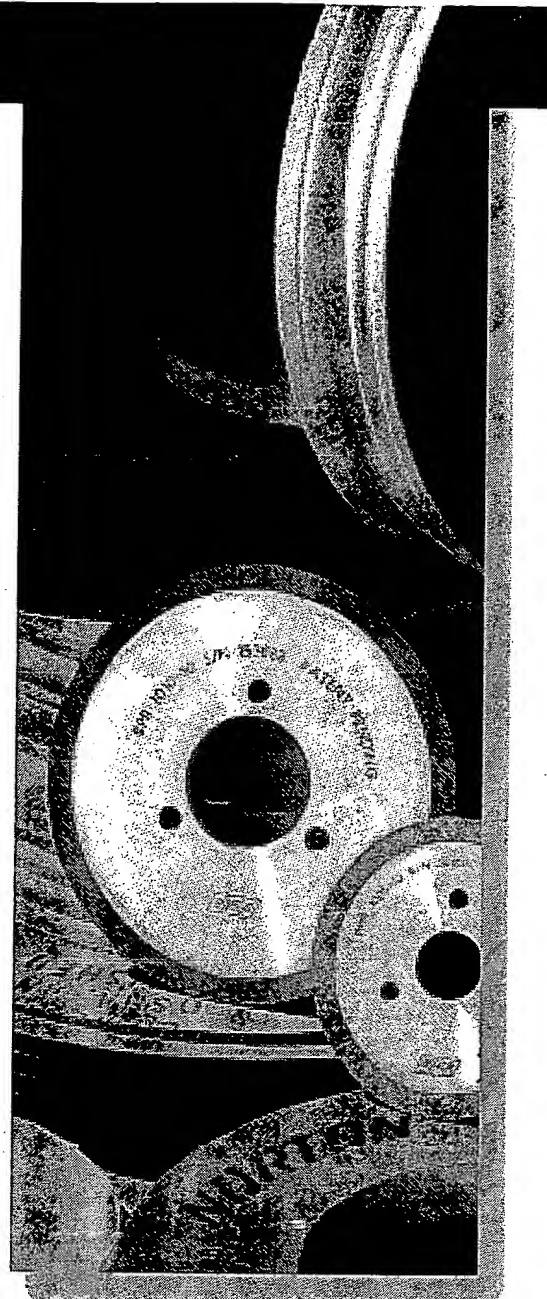
NORTON	PATENT PENDING
BPR1005-10	S/N 000000
OD = 4.001	LOC .251 RAD .0100

Suggested Operating Parameters:

A copy of our Suggested Lap-free BPR Dressing Parameters is packaged and shipped with each BPR roll. For a personal copy, contact your local superabrasive sales engineer, or an Arden product engineer.

Product Availability:

This product is made to order, with standard lead times of: 6-8 weeks for new designs, and 3 to 4 weeks for repeat orders.



Your local Norton distributor can help you select the right Norton abrasive for all of your grinding and finishing needs. For a complete list of Norton distributors, visit our web site: www.nortonabrasives.com



ISO-9001 REGISTERED



Leading Technology, Leading Solutions™

NORTON COMPANY One New Bond Street, Worcester, MA 01615-0008
Customer Service: Telephone: 1-800-438-4773 ■ Fax: 1-828-684-1401